FEEDER 7U5 POWER SUPPLY UPGRADE

Traffic, Transport and Access Impact Assessment Report

Prepared for:
Transport for New South Wales
Transport for New South Wales
Feeder 7U5 Power Supply Upgrade
Traffic, Transport and Access Impact Assessment Report

SLR Ref No: 610.18565-R02-Traffic-v2.0.docx
March 2019

PREPARED BY

SLR Consulting Australia Pty Ltd
ABN 29 001 584 612
2 Lincoln Street
Lane Cove NSW 2066 Australia
(PO Box 176 Lane Cove NSW 1595 Australia)
T: +61 2 9427 8100
E: sydney@slrconsulting.com  www.slrconsulting.com

BASIS OF REPORT

This report has been prepared by SLR Consulting Australia Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Transport for New South Wales (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of the Client. No warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from SLR

SLR disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

DOCUMENT CONTROL

<table>
<thead>
<tr>
<th>Reference</th>
<th>Date</th>
<th>Prepared</th>
<th>Checked</th>
<th>Authorised</th>
</tr>
</thead>
<tbody>
<tr>
<td>610.18565-R02-v2.0</td>
<td>15 March 2019</td>
<td>Drew Mansini</td>
<td>Tim Sullivan</td>
<td>Tim Sullivan</td>
</tr>
</tbody>
</table>
EXECUTIVE SUMMARY

TfNSW has requested the services of a Traffic Technical Advisor (TTA) to provide a Traffic, Transport and Access Impact Assessment Report supporting the Main Works of the Feeder 7U5 Upgrade Project. The specific upgrade to be assessed as a part of this stage of works is the installation of a new 33kV feeder, known as Feeder 7U5, extending along a 1.2km route from the Surry Hills Ausgrid substation to the Chalmers Street substation. The study area to be assessed within this document is generally confined to areas of the public domain, with additional consideration given to activities within the Sydney Train Depot. Construction activities to be undertaken wholly within the rail corridor are not within the scope of this assessment as they are not expected to impact upon the public.

Throughout the duration of project construction activities, it is expected that following transport related items will be impacted:

- Pedestrian services and walking routes.
- Cyclist services and cycle routes.
- Public vehicle routes.
- Public vehicle parking.
- Building access.

Impacts to the above will vary depending on the combination of the timing within the construction programme and the location where the works will be undertaken, with construction activities generally progressing along the route from the Sydney Trains Depot through to the Surry Hills Substation. Impacts to the above will also vary depending on the specifics of the cabling installations and whether they occur within the footpath or the road pavement.

Impacts to the public are expected to be minor during the early stages of construction within the rail corridor and more heavily during trenching and cable pulling within the road corridor. There will be occasions where partial or full road closures may be necessary. These activities will typically relate to the trenching and cabling works which either run across or along roads.

To effectively manage and mitigate the impacts of project construction activities on the public, a Construction Traffic Management Plan (CTMP) inclusive of detailed Traffic Control Plans (TCP) would need to be prepared and submitted to the NSW RMS and/or Council. This would occur following the resolution of the construction methodology and once the final locations of the CSR and pits have been determined.

The TCP’s would incorporate standard signage to inform the public of any temporary changes implemented to accommodate the construction activities including works by heavy machinery, road lane and footpath closures including detour routes, changes in speed limits, and warnings when traffic or pedestrians may need to be stopped as directed. This signage would be incorporated in advance of and throughout the works area.

Ultimately, the impacts can be mitigated and/or minimised by considering the recommendations presented within this Traffic, Transport and Access Impact Assessment Report which has investigated the potential impacts to traffic and transport related infrastructure and provided mitigation strategies to manage these impacts. The content within this report has been based upon a set of preliminary construction activities, and should be used to support the development of a CTMP once the construction approach has been fully resolved.
CONTENTS

1 INTRODUCTION ................................................................................................................. 6
  1.1 Background .................................................................................................................. 7
  1.2 Project Objectives ......................................................................................................... 8
  1.3 Study Scope .................................................................................................................. 9
  1.4 Study Area ................................................................................................................... 9

2 EXISTING CONDITIONS ..................................................................................................... 11
  2.1 Surrounding Land Uses ...............................................................................................11
  2.2 Surrounding Road Network ........................................................................................11
  2.3 Pedestrian and Cycle Access and Facilities ..................................................................13
    2.3.1 Pedestrian Facilities .............................................................................................13
    2.3.2 Cyclist Facilities ....................................................................................................14
  2.4 Constraints ...................................................................................................................15

3 CONSTRUCTION ACTIVITIES .............................................................................................. 16

4 CONSTRUCTION IMPACTS .................................................................................................. 20
  4.1 Haulage Routes ............................................................................................................20
  4.2 Pedestrian and Cyclist Impacts ....................................................................................22
    4.2.1 Staff Only Pedestrian Walkway - Sydney Trains Depot ..........................................23
    4.2.2 Pedestrian/Cyclist Shared Path – Chalmers Street to Eddy Avenue ........................23
    4.2.3 Pedestrian/Cyclist Shared Path – Elizabeth Street ..................................................23
    4.2.4 Pedestrian Footpaths – Albion Street ....................................................................24
    4.2.5 Pedestrian Footpaths – Commonwealth Street .......................................................24
    4.2.6 Pedestrian Footpath – Ann Street ..........................................................................24
  4.3 Traffic Impacts ..............................................................................................................24
    4.3.1 Construction Traffic ...............................................................................................24
    4.3.2 Road Impacts ...........................................................................................................26
      4.3.2.1 Eddy Avenue ....................................................................................................27
      4.3.2.2 Elizabeth Street ................................................................................................28
      4.3.2.3 Albion Street .....................................................................................................29
      4.3.2.4 Commonwealth Street ......................................................................................30
      4.3.2.5 Ann Street .........................................................................................................31
    4.3.3 Construction Access/Staff Parking ..........................................................................32
    4.3.4 Cumulative Impacts .................................................................................................35
  4.4 Safety Issues ..................................................................................................................36
    4.4.1 Pedestrians and Cyclists ........................................................................................36
CONTENTS
4.4.2 Road Users........................................................................................................... 36
4.5 Mitigation Strategies ............................................................................................... 37
5 SUMMARY ..................................................................................................................... 40

DOCUMENT REFERENCES

TABLES
Table 1 Public Road Network ......................................................................................... 12
Table 2 Feeder 7U5 Main Works Construction Activities ............................................ 16
Table 3 Impacts to Pedestrian and Cyclist Facilities ..................................................... 22
Table 4 Road Impacts ...................................................................................................... 26

FIGURES
Figure 1 Feeder 7U5 Route ............................................................................................. 7
Figure 2 Feeder 7U5 Study Area .................................................................................... 10
Figure 3 Zone Boundaries .............................................................................................. 11
Figure 4 Public Road Network ....................................................................................... 12
Figure 5 On-street Parking ............................................................................................ 13
Figure 6 Local Pedestrian Facilities .............................................................................. 14
Figure 7 Sydney Cycling Map - Extract .......................................................................... 15
Figure 8 State & Regional Roads ................................................................................... 21
Figure 9 Height Restricted Rail Bridge .......................................................................... 22
Figure 10 Eddy Avenue .................................................................................................. 27
Figure 11 Elizabeth Street .............................................................................................. 28
Figure 12 Albion Street .................................................................................................. 29
Figure 13 Commonwealth Street .................................................................................. 30
Figure 14 Ann Street ...................................................................................................... 31
Figure 15 Erskineville Laydown Area ............................................................................. 32
Figure 16 Access – Sydney Trains Depot ......................................................................... 33
Figure 17 Access – Chalmers Street & Eddy Avenue ...................................................... 34
Figure 18 Access – Eddy Avenue & Elizabeth Street ....................................................... 35
1 Introduction

SLR Consulting Pty Ltd (SLR) has been commissioned by Transport for New South Wales (TfNSW) to undertake traffic assessments to support a component of the proposed Power Supply Upgrade (PSU) Program for infrastructure associated with the Sydney metropolitan rail network. The specific upgrade to be assessed as a part of this stage of works is the installation of a new 33kV feeder, known as Feeder 7U5, extending along a 1.2km route from the Surry Hills Ausgrid substation to the Chalmers Street substation.

TfNSW has specifically requested the services of a Traffic Technical Advisor (TTA) to provide a Technical Note based upon the Early Works environmental assessment, and a Traffic, Transport and Access Impact Assessment Report based upon the Main Works as part of the Review of Environmental Factors (REF). The content referenced herein forms the Traffic, Transport and Access Impact Assessment Report, and will assess the relevant impacts as a result of the main body of works undertaken to install Feeder 7U5 between the two substations.

Consideration has specifically been given to the impacts caused by construction activities upon pedestrians and cyclists, vehicular traffic, public on-street parking, and construction vehicle parking. Appropriate mitigations have been recommended to reduce or avoid the impacts caused by construction activities and ensure minimal disruptions to the public.
1.1 Background

The PSU Program was initiated in 2005 by RailCorp in an effort to ensure that Sydney’s rail network would remain capable of meeting the expected power requirements of future train timetables, and the requirements of the new generation of air-conditioned trains. The PSU Program involves the construction of new electrical infrastructure and upgrades to substations, section huts, overhead wiring and feeders across the network.

More specific to the scope of works for this component of the project, a power study undertaken by Sydney Trains and released in August 2017 modelled the AC high voltage 33kV and 66kV network requirements of the 2018 timetable inclusive of the full deployment of New Inner-city Fleet (NIF) and Sydney Growth Train (SGT) fleets and the addition of the future Sydney Metro. This study made recommendations to assess and upgrade identified AC feeders across the Sydney Trains electrical network to support future power and traction demands.

The 33kV Feeder 755 was identified as not being capable of meeting future network demands in its current state and therefore flagged for upgrading. To increase network capacity, this stage of the overall PSU Program would construct a new 33kV feeder, known as Feeder 7U5, which would extend along a 1.2km route from the Surry Hills Ausgrid substation to the Chalmers Street substation. The proposed route can be seen on Figure 1.

Figure 1  Feeder 7U5 Route
1.2 Project Objectives

Feeder 7U5 will comprise a combination of Galvanised Steel Trough (GST) and Combined Service Route (CSR) hardware along its length between the two substations. Figure 1 identifies those sections proposed as either GST or CSR along the feeder route.

Beginning at the Chalmers Street Substation and within the rail corridor, the GST will be fixed to the boundary retaining wall of Central Station above and parallel to existing GST with some sections of the GST route mounted on low level ground posts or fixed to existing structures. A small section of CSR will allow the cabling to cross underneath the location of an existing emergency sliding access gate within the Sydney Trains Depot. At the north of the GST route, the cabling will cross through an existing heritage sandstone wall by a borehole through the foundation of the wall, and includes the installation of civil pits on either side of the wall (a concrete pit within the garden site area and a caisson shaft within the rail corridor).

Following the crossing of the sandstone wall, a length of CSR will be installed by tunnel boring underneath the Sydney Light Rail Interface and Eddy Avenue, and then trenching the rest of the way through to a new jointing pit positioned at the junction of Elizabeth Street and Albion Street to be located within the footpath. From this jointing pit, trenching will occur to carry the CSR through to the Surry Hills Substation where throughout this route it will be accommodated within either the road or the footpath subject to further geotechnical investigations. Additional cable maintenance and pulling pits will be installed along this length within the footpath or roadway subject to detailed design and available space.

To support the construction activities as a part of the main body of works, the following potential (and subject to approval) site compound and material laydown areas have been identified with their indicative locations marked on Figure 1:

- Compound located at Mortuary Station including site office, ablution block and meals room.
- A general laydown area within the carpark at the south of the Sydney Trains Depot. All 7U5 possessions including machines, materials and equipment.
- A general laydown area adjacent to the Chalmers Street substation, used for stockpiling/storage during possessions.
- Ablution block and meal room in the open area between the Prince Alfred Substation and Chalmers Street Substation.
- Site office inside the existing building behind the Prince Alfred Substation.
- Laydown area within the garden to the north of the Chalmers Street entrance to Central Station. Predominantly associated with the installation of the concrete shaft, HV pit, under boring of the Sydney Light Rail Interface and Eddy Avenue and CSR works, including machines, materials and equipment.
- Laydown area within the western verge of Elizabeth Avenue in the location of the CSR route. Predominantly associated with under boring and CSR works, including machines, materials, equipment, toilets, a site office and a lunch room.

Additional to the above, a large compound has been proposed adjacent to the Erskineville Substation accessed via 136 Railway Parade, Erskineville, for material storage throughout the entire duration of the project.
1.3 Study Scope

This Traffic, Transport and Access Impact Assessment report details consideration of the anticipated traffic, transport and access matters associated with Main Works for the Feeder 7U5 Upgrade project. This consideration includes the following:

- Existing traffic, transport and access conditions and facilities.
- Construction impacts associated with the Main Works of the project.
- Potential mitigation measures recommended to avoid, mitigate or manage impacts.

This assessment has been prepared noting the following:

- Construction activity assumptions were provided to SLR by TfNSW.
- The specific construction activities to be undertaken are not yet fully resolved and will be subject to further investigations to be undertaken by TfNSW.
- No traffic, pedestrian, cyclist or parking demand surveys were conducted.

1.4 Study Area

The study area to be assessed within this document is generally confined to areas of the public domain, with additional consideration given to activities within the Sydney Train Depot. Construction activities to be undertaken wholly within the rail corridor are not within the scope of this assessment as they are not expected to impact upon the public. The study area has been illustrated on Figure 2 and represents the areas where the impacts of the project have been considered.
Figure 2  Feeder 7US Study Area

Source: Nearmap/SLR
2 Existing Conditions

2.1 Surrounding Land Uses

The site for the Feeder 7U5 Upgrade is contained within the Sydney inner city suburb of Surry Hills, running directly adjacent to the eastern boundary of Sydney Central Station and eastward towards the Surry Hills Substation. Surry Hills has a mixture of residential, commercial and light industrial areas. As per the Sydney Local Environment Plan 2012, both the Sydney Trains Depot and the rail corridor are classified as SP2 - Infrastructure land. External to the rail corridor, the precinct of the project is contained predominantly within B4 - Mixed Use land with a smaller precinct of R1 - General Residential land at the north-eastern extents of the feeder route. Figure 3 illustrates the zone boundaries in the context of the project study area.

Figure 3 Zone Boundaries

2.2 Surrounding Road Network

Separate to the rail corridor, the project will remain within road corridors. After the CSR route passes through the heritage sandstone wall at the corner of Elizabeth Street and Eddy Avenue, which is within the rail corridor, it will enter the road corridor with works confined to the following:

- North within the western verge of Elizabeth Street after crossing underneath Eddy Avenue through to the Albion Street intersection.
- East along Albion Street to Commonwealth Street.
- North along Commonwealth Street to Ann Street.
- East along Ann Street to the Surry Hills substation.

The boundary of the potential work area external to the rail corridor and in relation to the public road network has been illustrated on Figure 4 with Table 1 summarising the specifics of the aforementioned roads. It should be noted that the lane configurations along Elizabeth Street and Eddy Avenue vary along their lengths and so the summary below is indicative of the form of the road at the location of works.

**Figure 4  Public Road Network**

![Public Road Network](Image)

**Table 1  Public Road Network**

<table>
<thead>
<tr>
<th>Road Name</th>
<th>Lane Configuration</th>
<th>Footpaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elizabeth Street</td>
<td>6 Traffic Lanes (2-way) + 2 Bus Lanes</td>
<td>Shared path (west) + footpath (east)</td>
</tr>
<tr>
<td>Eddy Avenue</td>
<td>5 Traffic Lanes (2-way)</td>
<td>Footpaths both sides.</td>
</tr>
<tr>
<td>Albion Street</td>
<td>4 Traffic Lanes (2-way) to 2 Traffic Lanes (1-way)</td>
<td>Footpaths both sides.</td>
</tr>
<tr>
<td>Commonwealth Street</td>
<td>2 Traffic Lanes (2-way)</td>
<td>Footpaths both sides.</td>
</tr>
<tr>
<td>Ann Street</td>
<td>2 Traffic Lanes (2-way)</td>
<td>Footpaths both sides.</td>
</tr>
</tbody>
</table>

Source: SLR

On-street parking is also present within the study area along Albion Street, Commonwealth Street and Ann Street. **Figure 5** identifies the various parking areas and classifications of parking within these areas.
2.3 Pedestrian and Cycle Access and Facilities

2.3.1 Pedestrian Facilities

Within the study area are a number of pedestrian facilities which include the following:

- Staff-only pedestrian walkway to/from Chalmers Street to within the Sydney Trains Depot.
- Public pedestrian/cyclist shared path between the Chalmers Street entrance to Central Station and Eddy Avenue.
- Public pedestrian/cyclist shared path along the western boundary of Elizabeth Street.
- Public pedestrian footpaths and building access along Albion Street.
- Public pedestrian footpaths and building access along Commonwealth Street.
- Public pedestrian footpaths and building access along Ann Street.

Figure 6 identifies each of the above pedestrian facilities and where they sit within the study area.
2.3.2 Cyclist Facilities

Within the study area are a number of cyclist facilities, as well as routes generally identified as cyclist friendly which include the following:

- Off-road shared paths along Elizabeth Street, Eddy Avenue and bordering the east of Central Station.
- A low-traffic on-road quiet route designated along Commonwealth Street.

*Figure 7* is an extract from Sydneycycleway’s *Sydney Cycling Map – Feb 2017* zoomed to the region of the project.
Aside from the pathways mentioned previously, there are no parking or storage facilities for bicycles in the local area, with the closest storage shed located at the Redfern Train Station to the south.

### 2.4 Constraints

The project partially occurs within the state heritage curtilage of “Central Railway Station and Sydney Terminal Group” listed under the *Heritage Act 1977*. Central Station is also listed on the Sydney Trains s170 Register and the *Sydney Local Environment Plan 2012*.

The project footprint is also located within highly trafficked areas that are already impacted by the current Sydney Metro and Sydney Light Rail projects and so any impacts are likely to be cumulative.
3 Construction Activities

The subject of this report is an assessment of the impacts of the construction activities associated with the Main Works of the Feeder 7U5 Upgrade project. Preliminary geotechnical investigations (early works) have previously been considered within the SLR’s Technical Note dated 9 January 2019.

The Main Works construction activities are those associated with the installation of the 7U5 feeder between the Chalmers Street Substation and the Surry Hills substation, noting that a small section of GST within the rail corridor has been included within the Early Works. These works will see the installation of CSR and GST segments along the feeder route with additional cable maintenance and pulling pits as well as jointing pits where required. The scheduling of construction activities are subject to planning approval. Table 2 below lists the Main Works construction activities as specified by TfNSW.

Table 2 Feeder 7U5 Main Works Construction Activities

<table>
<thead>
<tr>
<th>Main Works construction activities</th>
<th>Plant and equipment</th>
<th>Day / Night works</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepare site laydown area adjacent to Erskineville substation, material deliveries and temporary site fencing installation. Access via 137 Railway Parade, Erskineville. This laydown area would be used for the duration of main works.</td>
<td>Crane Truck, 2T Tipper, small power tools, forklift, front end loader, excavator</td>
<td>Day and night</td>
</tr>
<tr>
<td>Other laydown areas have been identified and are subject to approval:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Footpath of Elizabeth Street for adjacent geotechnical investigations, potholing and trenching works</td>
<td>Truck loader for site sheds, crane truck, utes, generator</td>
<td>Day and night</td>
</tr>
<tr>
<td>Chalmers Street entrance garden for adjacent civil pit, sandstone wall and trenching works.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Area adjacent the Chalmers Street substation for stockpiling/storage during possessions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carpark area south of Sydney Trains Central Network Base for adjacent GST, CSR and underboring works.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two potential site compound areas have been identified within Sydney Trains land and are subject to approval:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existing office space behind Prince Alfred Substation. Installation of an Ablution block and meal room. Vehicle access from Chalmers Street. Mortuary siding. Installation of site office, ablation block, and meal room. Vehicle access from Lee Street.</td>
<td>Truck loader for site sheds, crane truck, utes, generator</td>
<td>Day and night</td>
</tr>
<tr>
<td>Pothoking within roads and footpaths and within Chalmers Street entrance garden to identify known and unknown services. Potholes would be reinstated following completion of works.</td>
<td>Sucker truck, excavator with auger/breaker, saw/road cutting machines, bogie for spoil removal/material delivery, concrete agitator, jackhammer, roller, crew truck, 2T tipper, ute</td>
<td>Day and night</td>
</tr>
<tr>
<td>Main Works construction activities</td>
<td>Plant and equipment</td>
<td>Day / Night works</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Borehole drilling in two locations, at the Chalmers Street entrance garden and within the footpath on</td>
<td>Crane truck, sucker truck, excavator, drilling rig</td>
<td>Day and night</td>
</tr>
<tr>
<td>Elizabeth Street. Up to two boreholes would be required on each side.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trenching from the civil riser shaft pit to start of GST.</td>
<td>Hi-rail excavator, sucker truck and crane/crew truck, hydrema</td>
<td>Day and night</td>
</tr>
<tr>
<td>Access via Hi-Rail access pad.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Installation of transitional CSR/GST between the caisson shaft and the start of GST. One of three</td>
<td>EWP, Crew Truck, Track Trolleys, lighting towers, small tools, rattle gun, hammer</td>
<td>Day and night</td>
</tr>
<tr>
<td>options would be undertaken:</td>
<td>drill, generator, drum truck, crane, winch truck</td>
<td></td>
</tr>
<tr>
<td>Cables within GST or Galvanised Pipe following the sandstone wall, fixed using either new or existing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>brackets and/or free-standing posts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New and/or existing CSR/GST route</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New GST/Galvanised Pipe fixed using new brackets and posts fixed to buildings or roof</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Installation of GST along corridor retaining wall, cable installation including winches, rollers</td>
<td>EWP, Crew Truck, Track Trolleys, lighting towers, small tools, rattle gun, hammer</td>
<td>Day and night</td>
</tr>
<tr>
<td>setup. Access via Hi-Rail access pad.</td>
<td>drill, generator, drum truck, crane, winch truck</td>
<td></td>
</tr>
<tr>
<td>Installation of CSR under siding access gate. Access via Hi-Rail access pad at the Sydney Yard Depot.</td>
<td>Hi-rail excavator, sucker truck and crane/crew truck, hydrema</td>
<td>Day and night</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potential vegetation removal in the Chalmers Street entrance garden depending on access requirements.</td>
<td>Mulcher, chipping truck, chainsaw, hydraulic jacks, ute</td>
<td>Day</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Installation of Civil Pits adjacent to the heritage sandstone wall. Installation of civil riser</td>
<td>Excavator with hammer &amp; auger, underbore machine, core drill, Sucker truck, crane</td>
<td>Day and night</td>
</tr>
<tr>
<td>shaft inside rail corridor to bring cables from park area to rail corridor level.</td>
<td>truck, 100T crane, compactor, concrete truck/agitator, bogie tipper, concrete pump</td>
<td></td>
</tr>
<tr>
<td>Excavate and crane in concrete pit in the Chalmers Street entrance garden north of the sandstone</td>
<td>and vibrator, power tools, lighting towers, generator, bogie for spoil removal,</td>
<td></td>
</tr>
<tr>
<td>wall. Drill through the base of the sandstone wall.</td>
<td>large lorry for delivery.</td>
<td></td>
</tr>
<tr>
<td>Main Works construction activities</td>
<td>Plant and equipment</td>
<td>Day / Night works</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Further installation of GST along corridor retaining wall and installation of local CSR routes to pit and base/lids to shaft including concreting works. Installation of steel ladders &amp; levels within the shaft, waterproofing.</td>
<td>Excavator with hammer/auger, sucker truck, crane, hydrema, Elevated Work Platform (EWP), crew truck, track trolleys, small tools, whacker packer, hammer drill, core drill, rattle gun, generator, lighting towers, street sweater, concrete pump, bobcat, asphalt truck, Profiler, ute</td>
<td>Day and night</td>
</tr>
<tr>
<td>CSR installation from civil pits to Elizabeth Street/Albion Street with Light Rail Interface. Excavation of a temporary bore pit 8m x 8m x 6m deep. Underboring works are proposed from the Chalmers Street entrance garden to the start of the Elizabeth Street footpath. Open trenching would then occur along the footpath to the cable pit. Two temporary bore pits are required to set off and receive the underbore on each side of Eddy Avenue. These would be constructed within the Chalmers Street Entrance garden and within the footpath of Elizabeth Street. The temporary bore pits would be constructed up to 6m wide by 5m long by 5m deep via mechanical excavation. Pits to be reinstated following completion of underboring works.</td>
<td>Sucker Truck, Bogie, Crew Truck, Rollers, Excavator with hammer/auger, small tools, whacker packer, hammer drill, core drill, rattle gun, generator, lighting towers, street sweater, underbore machine, concrete agitator, road/saw cutter, 2T tipper, ute</td>
<td>Day or night works to be confirmed</td>
</tr>
<tr>
<td>Installation of electrical infrastructure within Chalmers Street Substation including core through external wall to connect railway corridor to Chalmers Street tunnel and substation. Installation of cable trays, ladders, cabling. Amendments to busbar and protection system within the switchgear.</td>
<td>Mewp, scaffolding, small hand tools and equipment, concrete coring drill</td>
<td>Day and night</td>
</tr>
</tbody>
</table>
Main Works construction activities | Plant and equipment | Day / Night works
--- | --- | ---
Trenching along Albion Street, Commonwealth Street and Ann Street. Trenching may be undertaken within the road or footpath, design to be confirmed. Typical trench is 0.6m wide and 1.5m deep however up to 1.2m wide and 3.0m deep dependent upon existing services. Works include temporary and permanent restoration of existing road/footpath and the inclusion of concrete maintenance/access pits. Note: potential for trench to be increased in width to accommodate further spare capacity for TfNSW critical projects may be required. | Sucker Truck, Bogie, Crew Truck, Rollers, Excavator with hammer/auger, small tools, whacker packer, jackhammer, hammer drill, core drill, rattle gun, generator, lighting towers, street sweeper, underbore machine, concrete agitator, road/saw cutter, 2T tipper, ute, asphalt truck, crane, bobcat | Day or night works to be confirmed
Cable pull within the rail corridor and along Elizabeth Street to Jointing Pit. Partial Road closures may be required at Eddy Avenue and Elizabeth Street intersections. | Winch Truck, Cable Drum Truck, Rollers, Crane dependent on drum size and set-up, small tools, generators, lighting towers | Day and night
Cable pull within roads/footpath. Road closures may be required dependent upon pit locations along route (Elizabeth Street, Albion Street, Commonwealth Street and Ann Street). | Winch Truck, Cable Drum Truck, Rollers, Crane dependent on drum size and set-up, small tools, generators, lighting towers | Day or night works to be confirmed
Cabling at jointing pit on Elizabeth Street and Cable Clamps/Ties in access pits. | Crew truck, small hand tools, smith lights, tent, water pump | Day or night works to be confirmed
Labelling, Lidding, Finalisation of GST and Defects Close Out for Sign-Off for entire route – Ausgrid approval, may include some testing. | Hi-rail crane truck and crew truck, hand tools, lighting towers | Day or night works to be confirmed
Commissioning Feeder 7U5 at Chalmers Street. | Small hand tools | Day or night works to be confirmed

Source: TfNSW

As previously mentioned, the specifics of the construction activities are yet to be fully resolved as these will largely rely upon the results of further investigations (service searches, geotechnical reports). Therefore, the exact impacts of the construction activities can at this stage only be estimated based upon the provided information.
4 Construction Impacts

Throughout the duration of project construction activities, it is expected that following transport related items will be impacted:

- Pedestrian services and walking routes.
- Cyclist services and cycle routes.
- Public vehicle routes.
- Public vehicle parking.
- Building access.

Impacts to the above will vary depending on the combination of the timing within the construction programme and the location where the works will be undertaken, with construction activities generally progressing along the route from the Sydney Trains Depot through to the Surry Hills Substation. Impacts to the above will also vary depending on the specifics of the cabling installations and whether they occur within the footpath or the road pavement.

It has been proposed that works be undertaken both within and outside the standard (NSW) Environment Protection Authority (EPA) construction hours, with works throughout the program occurring on weekdays and weekends (including Saturday and Sunday) during both the day and night. It is understood that extended working hours are being sought to minimise the impacts to highly trafficable areas by allowing construction to continue outside of the busiest periods. Approval from TfNSW would be required for any out of hours work with the affected community to be notified as outlined in TfNSW’s Construction Noise and Vibration Strategy (TfNSW, 2018b). The construction noise and vibration impacts are not a component of this report and have been considered in a separate report.

4.1 Haulage Routes

As per the National Heavy Vehicle Regulator (NHVR), the project area is surrounded by roads with no direct access available to larger vehicles (B-Doubles and above). The closest approved routes are Broadway/Great Western Highway to the west, Cleveland Street to the south (Approved Route with Travel Conditions), and the Eastern Distributor to the east (Approved Route with Travel Conditions) with each of these classified by RMS as State Roads. However, as no large vehicles (B-Doubles and above) have been identified for construction activities, direct access to the site via these roads is not considered mandatory. Instead, direct access to the site can be facilitated via RMS classified Regional Roads, which include Chalmers Street, Elizabeth Street, Eddy Avenue, Foveaux Street and Albion Street.

The vehicles identified under Plant and Equipment from within Table 2 are generally those up to and including the size of a Heavy Rigid Vehicles (HRV). It is recommended that any large vehicles (HRVs) travel via the Regional Roads to reach the site. Where oversize vehicles such as Articulated Vehicles (AVs) may be required for certain construction activities or deliveries, specific permits would be required for such movements and obtained from the City’s Construction Regulation Unit (as per the City of Sydney Standard Requirements for Construction Traffic Management Plan – Appendix A). Figure 8 shows the State Roads and Regional Roads within the region of the site. It should be noted that ultimately the exact routing of heavy vehicles would be refined and resolved by the nominated contractor once detailed planning progresses.
Access by over-height vehicles must also be considered, with the rail bridge crossing Eddy Avenue having a minimum height restriction of 3.8m at its lowest. Considering the proposed location for the access point into the work area at the corner of Elizabeth Street and Eddy Avenue, it is possible that all vehicles exiting the site may need to pass underneath this bridge. **Figure 9** shows the garden site area to be used for construction activities in relation to the height restricted rail bridge on Eddy Avenue.
Figure 9   Height Restricted Rail Bridge

4.2  Pedestrian and Cyclist Impacts

Both pedestrian and cyclist facilities are expected to be impacted by project construction activities with minor impacts during the early stages of construction within the rail corridor and more heavily during trenching and cable pulling within the road corridor.

Table 3 below lists the previously identified pedestrian and cyclist facilities from sections 2.3.1 and 2.3.2 of this report and the extent to which they will likely be impacted during construction.

Table 3  Impacts to Pedestrian and Cyclist Facilities

<table>
<thead>
<tr>
<th>Facility</th>
<th>Activity &amp; Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff-only pedestrian walkway to/from Chalmers Street to within the Sydney Trains Depot.</td>
<td>Minimal detour required during installation of the GST and CSR within the Sydney Trains Depot (likely to be on the other side of the access road).</td>
</tr>
<tr>
<td>Public pedestrian/cyclist shared path between the Chalmers Street entrance to Central Station and Eddy Avenue.</td>
<td>Minor interruptions as construction vehicles enter/exit the garden site area during pit installations and excavations in the vicinity of the sandstone wall. Minor interruptions during GST and CSR installations in the vicinity of the sandstone wall.</td>
</tr>
<tr>
<td>Public pedestrian/cyclist shared path along the western verge of Elizabeth Street.</td>
<td>Detours required during service searching activities. Detours required during CSR installation. Possible detours during cable pulling.</td>
</tr>
<tr>
<td>Facility</td>
<td>Activity &amp; Impacts</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Public pedestrian footpaths and building access along Albion Street.</td>
<td>Detours required during service searching activities. Possible detours required during CSR installation if CSR occurs within footpath. Possible detours required during cable pulling if cable pulling pits are located within footpath.</td>
</tr>
<tr>
<td>Public pedestrian footpaths and building access along Commonwealth Street.</td>
<td>Detours required during service searching activities. Possible detours required during CSR installation if CSR occurs within footpath. Possible detours required during cable pulling if cable pulling pits are located within footpath.</td>
</tr>
<tr>
<td>Public pedestrian footpaths and building access along Ann Street.</td>
<td>Detours required during service searching activities. Possible detours required during CSR installation if CSR occurs within footpath. Possible detours required during cable pulling if cable pulling pits are located within footpath.</td>
</tr>
</tbody>
</table>

Source: SLR

As per Table 3, several construction activities will require detours to be put in place where the activity is directly within the footpath or pedestrian/cyclist shared path. These will be discussed in further detail below.

### 4.2.1 Staff Only Pedestrian Walkway - Sydney Trains Depot

Temporarily closing the existing pedestrian pathway within the Sydney Trains Depot is not regarded as a concern as this is a very underutilised pathway used only by staff. When the construction area is designated, there will be sufficient space on the opposite side of the access road for staff to pass through. At the time of observation (5pm peak period) there were no pedestrians observed using this walkway.

### 4.2.2 Pedestrian/Cyclist Shared Path – Chalmers Street to Eddy Avenue

It is expected that the pedestrian/cyclist shared path between the Chalmers Street entrance to Central Station and Eddy Avenue will remain open during construction, with minimal interruptions occurring during vehicle entries and exits to the designated work site area. In consideration of the high utilisation of this path and a lack of convenient detouring, any blocking of this path should be limited and only during night works if feasible. At the time of observation (5pm peak period) this path was heavily trafficked.

### 4.2.3 Pedestrian/Cyclist Shared Path – Elizabeth Street

This shared path on the western boundary of Elizabeth Street facilitates both pedestrian and cyclist movements. Detours may be necessary along the path during service searches and the installation of the CSR depending on the final location of the CSR and the area segregated as a work area. Considering that the path is 2.8m wide, it may be possible for pedestrians and cyclists to continue using the path during certain project activities although this is unlikely during CSR installation. A secondary walkway on this side of the road (directly adjacent to the bus lane) may be appropriate for pedestrian detours, but is not suitable for cyclists, wheelchairs or mobility scooters due to its constrained form. If full closures of the path are required, it may be necessary to detour users of this path to the opposite (eastern) side of Elizabeth Street. If pedestrians are detoured to this side of the road, the level of pedestrian congestion should be monitored as the crossing which crosses Elizabeth Street at the
entrance to Central Station was observed to be very busy during the afternoon period. However, the light use of this shared path at the time of observation (5pm peak period) would indicate that the volumes likely to require a detour would be low.

4.2.4 Pedestrian Footpaths – Albion Street

Depending upon the final stages of design and whether or not trenching and cabling is undertaken within the footpaths, detours may be necessary along either footpath (northern and/or southern). The width of the footpaths vary along their lengths and contain vegetation, and so it is unlikely that pedestrians would still be able to use a footpath if works were being undertaken within. As this road has relatively low vehicle traffic and multiple crossing facilities along its length, the impacts to pedestrians are likely to be low with any detours having minimal impacts. It would be necessary to retain building access adjacent to the footpaths as residential and commercial properties front the road. At the time of observation (5pm peak period) these footpaths had light to moderate use.

4.2.5 Pedestrian Footpaths – Commonwealth Street

Depending upon the final stages of design and whether or not trenching and cabling is undertaken within the footpath, detours may be necessary along either footpath (western and/or eastern). This road has relatively low vehicle traffic and no designated pedestrian crossings with very narrow footpaths. Based upon a visual inspection, it is more likely that trenching along Commonwealth Street would occur within the road itself, however if pedestrian detours were required then care should be taken to ensure any interactions with vehicle traffic are minimised. It would also be necessary to retain the building access to residential properties on the eastern footpath. At the time of observation (5pm peak period) these footpaths had light use.

4.2.6 Pedestrian Footpath – Ann Street

Depending upon the final stages of design and whether or not trenching and cabling is undertaken within the footpath, detours may be necessary along either footpath (north and/or south). This road has very low vehicle traffic (general local traffic only) and no designated pedestrian crossings with very narrow footpaths. Based upon a visual inspection and very narrow footpaths including vegetation, it is more likely that trenching along Ann Street would occur within the road itself, however if pedestrian detours were required then care should be taken to ensure any interactions with vehicle traffic are minimised. It would also be necessary to retain the building access to residential properties on both sides of the footpath. At the time of observation (5pm peak period) there were no pedestrians observed using the footpaths.

4.3 Traffic Impacts

4.3.1 Construction Traffic

The following is a summary of the road-based vehicular construction, plant and equipment that is expected throughout the Main Works of the project. This is not an exhaustive list although represents that which is expected at this stage of project planning.

- 2T Tipper
- Asphalt Truck
- Bobcat
• Bogie
• Cable Drum Truck
• Chipping Truck
• Concrete Pump
• Concrete Truck
• Crane Truck
• Crew Truck
• Elevated Work Platform
• Excavator
• Forklift
• Front End Loader
• Hydrema
• Lorry
• Profiler
• Roller
• Street Sweeper
• Sucker Truck
• Truck Loader (for site sheds)
• Ute
• Winch Truck

The specific types, sizes, duration of stay and demand of each of these will vary depending on the required use and would be confirmed once the nominated contractor has resolved a construction approach and programme. A number of the above may also be transported to the site by a truck and therefore the use of certain vehicles or equipment may be fully confined to within work areas. It is therefore assumed that the majority of construction traffic driving to and from the site would be either Medium Rig Vehicles (MRVs) or Heavy Rig Vehicles (HRVs). Where oversize vehicles such as Articulated Vehicles (AVs) may be required for certain construction activities or deliveries, specific permits would be required for such movements and obtained from the City’s Construction Regulation Unit (as per the City of Sydney Standard Requirements for Construction Traffic Management Plan – Appendix A).
As the majority of construction traffic is expected to be one-off deliveries of plant or equipment with little requirements for any haulage to occur (some soil removal/mulch removal), the traffic impacts arising from construction activities are expected to be minor and manageable subject to the preparation and activation of a Construction Traffic Management Plan (CTMP).

### 4.3.2 Road Impacts

As per the Main Works construction activities, there will be occasions where partial or full road closures are necessary. These activities will typically relate to the trenching and cabling works which either run across or along roads. The *City of Sydney Standard Requirements for Construction Traffic Management Plan – Appendix A* states that in these instances, the Applicant must apply to the City’s Traffic Works Co-ordinator and Construction Regulation Unit to organise appropriate approvals for partial or full road closures. The anticipated road closures are discussed further below. In any instance, partial closures with the assistance of either reducing the number of through lanes or instigating contra flow traffic management are preferable to full closures to minimise or negate the requirements for any detours.

*Table 4* below lists the roads directly impacted by project construction activities.

**Table 4  Road Impacts**

<table>
<thead>
<tr>
<th>Road</th>
<th>Activity</th>
</tr>
</thead>
</table>
| Eddy Avenue    | Construction traffic associated with vegetation removal and installation of Civil Pits.  
|                | Service searching with roads.                                            |
|                | Installation of CSR from Civil Pits to corner of Elizabeth Street and Albion Street. |
|                | Cable pull between pits along Elizabeth Street.                           |
| Elizabeth Street| Service searching with roads.                                            |
|                | Installation of CSR from Civil Pits to corner of Elizabeth Street and Albion Street.  
|                | Trenching along Albion Street, Commonwealth Street and Ann Street.        |
|                | Cable pull between pits along Elizabeth Street.                           |
|                | Cable pull from Elizabeth Street to Surry Hills Substation.               |
| Albion Street  | Service searching with roads.                                            |
|                | Trenching along Albion Street, Commonwealth Street and Ann Street.        |
|                | Cable pull from Elizabeth Street to Surry Hills Substation.               |
| Commonwealth Street | Service searching with roads  
|                | Trenching along Albion Street, Commonwealth Street and Ann Street.        |
|                | Cable pull from Elizabeth Street to Surry Hills Substation.               |
| Ann Street     | Service searching with roads                                             |
|                | Trenching along Albion Street, Commonwealth Street and Ann Street.        |
|                | Cable pull from Elizabeth Street to Surry Hills Substation.               |

Details about the impacts to each of the roads within *Table 4* have been discussed below.
4.3.2.1 Eddy Avenue

Figure 10 Eddy Avenue

Where the CSR crosses Eddy Avenue between the garden site area and the footpath along Elizabeth Avenue, it will underbored beneath Eddy Avenue. Temporary bore pits will be constructed at either side Eddy Avenue within the garden site area and at the start of the Elizabeth Street footpath. Eddy Avenue has two (2) through lanes westbound across a 6m (approx.) pavement width, a wide central median, and three (3) turning lanes eastbound across a 9m (approx.) pavement width. Whilst the underboring itself should not require the closure of Eddy Avenue, other associated tasks such as service searching or the transfer of equipment between site areas may require temporary partial lane closures, and any such closures should ideally be undertaken outside of peak traffic periods.
4.3.2.2  Elizabeth Street

A jointing pit is proposed within the pedestrian/cyclist shared path along Elizabeth Street, opposite Albion Street. From this jointing pit, the CSR will cross Elizabeth Street to reach Albion Street. At this location, Elizabeth Street has 22m (approx.) pavement width with two (2) through lanes and one (1) bus lane in each direction, as well as two (2) right turn lanes on the southbound approach.

The trenching will require either a partial road closure (if done in stages) or a full road closure (if completed all at once) depending on the construction methodology. Full closure of Elizabeth Street would ideally be avoided as this is a highly trafficked road supporting regular bus services. Staging the works and retaining 2-way access by reducing the available through lanes would be preferable at this location and ideally undertaken outside of peak traffic periods. If required, temporary detours along Eddy Avenue, Pitt Street and Hay Street may be suitable but could potentially result in congestion and impacts on travel time.

The bus lanes along Elizabeth Avenue must also be considered. Depending upon the amount of congestion which is expected on Elizabeth Street during peak hour periods, it may be necessary to retain the bus lanes (with altered alignments). This would allow buses to bypass the general traffic lanes and avoid increased delays to public transport. In this instance, manual traffic control could also be utilised to prioritise the movements of buses.
4.3.2.3 Albion Street

Figure 12 Albion Street

Installation of the CSR route is proposed along Albion Street within either the footpath or road pavement pending further design and investigations. Albion Street begins at Elizabeth Street as a 4-lane 2-way road with a 12m (approx.) pavement width, although after 75m narrows to a 2-lane 1-way (eastbound) road with a 7m (approx.) pavement width plus parking. The parking within the region of the works consists of a No Parking – Buses Excepted zone outside the Rydges Hotel, and 1hr parking unrestricted for residents (7 spaces) adjacent to the residential uses.

A visual inspection of the road suggests that if trenching were to occur within the road lanes, then it is likely that one lane could remain open to eastbound through traffic. If trenching was to occur adjacent to the through lanes and within the parking areas then potentially both through lanes could remain open. 2-way access within the first 75m of Albion Street should be retained, so if necessary the number of traffic lanes could be reduced. It would be expected that any losses to residential parking would need to be absorbed by the nearby local streets. Temporary closure of the bus-only parking area outside the Rydges Hotel may adversely impact the business and so it will be necessary to ensure accommodations for bus parking when redefining the temporary traffic areas. Vehicle access to the Rydges Hotel valet lobby and 260 Elizabeth Street (car park and loading dock) may be impacted, and as such consideration should be made to the impacts caused by any temporary access restrictions. Vehicle access to Mary Street and Commonwealth Street may also be impacted and so consideration must be given to whether or not access to these roads can be restricted temporarily or maintained at all times.

It should be noted that a cable maintenance and pulling pits will be installed along this route and could impact the overall traffic control depending on their final locations. It is possible that localised contra flow traffic control may be necessary or the temporary loss of some parking, but this largely depends on the final pit locations.
4.3.2.4 Commonwealth Street

Figure 13 Commonwealth Street

Installation of the CSR route is proposed along Commonwealth Street within either the footpath or road pavement pending further design and investigations. Commonwealth Street is a 2-lane 2-way road with parking on both sides and a 9.5m (approx.) pavement width. The parking within the region of the works consists of Salvation Army parking (2 spaces) and 1hr parking unrestricted for residents (5 spaces).

A visual inspection of the road suggests that if trenching were to occur within the road then 2-way traffic could be accommodated, although may result in the temporary loss of some parking. Alternatively, contra flow traffic control could be put in place to retain 2-way flow and retain some parking although this largely depends on the final positioning of the trenching. It would be expected that any losses to parking would need to be absorbed by the nearby local streets with the Salvation Army possibly requiring temporary permits for residential parking areas. Vehicle access to Little Albion Street may be impacted and so consideration must be given to whether or not access to this road can be restricted temporarily or should be maintained at all times.

It should be noted that a cable maintenance and pulling pits will be installed along this route and could impact the overall traffic control depending on their final locations. It is possible that localised contra flow traffic control may be necessary or the temporary loss of some parking, but this largely depends on the final pit locations.
4.3.2.5 Ann Street

Installation of the CSR route is proposed along Ann Street within either the footpath or road pavement pending further design and investigations. Ann Street is a 2-lane 2-way road with parking on both sides and an 8.0m (approx.) pavement width. The parking within the region of the works consists of 1hr parking unrestricted for residents (approx. 25 spaces) and a single PWD parking space.

A visual inspection of the road suggests that if trenching were to occur within the road then there would be impacts to through access and parking due to the constrained available width. It is likely that contra flow traffic control would be necessary to retain parking on at least one side of the road. Due to the reliance on parking by residents within this area, particularly on the southern side of Ann Street which has some 20 parking spaces within the region of the works, maintaining these parks if possible is a preferable outcome. Vehicle access to the 8 Ann Street car park may be impacted, and as such consideration should be made to the impacts caused by any temporary access restrictions. Vehicle access to Batman Lane and Smith Street may also be impacted and so consideration must be given to whether or not access to these roads can be restricted temporarily or maintained at all times.

It should be noted that a cable maintenance and pulling pits will be installed along this route and could impact the overall traffic control depending on their final locations. It is possible that localised contra flow traffic control may be necessary or the temporary loss of some parking, but this largely depends on the final pit locations.
4.3.3 Construction Access/Staff Parking

Access to the proposed work and laydown areas for vehicles can be predominantly be facilitated by the existing Regional Road network without requirements for the use of lower order roads. The exception is the Erskineville Substation laydown area which is accessed from Railway Parade (Figure 15 below), which is not a State or Regional Road. Where oversize vehicles such as Articulated Vehicles (AVs) may be required for the delivery of goods and equipment, specific permits would be required for such movements and obtained from the City’s Construction Regulation Unit (as per the City of Sydney Standard Requirements for Construction Traffic Management Plan – Appendix A). It may also be necessary to conduct further assessment to determine whether Railway Parade can physically accommodate one-off deliveries by oversize vehicles, although this matter likely would be the responsibility of the relevant delivery contractor.

Figure 15 Erskineville Laydown Area

Access into the Sydney Trains Depot will be via the existing access driveway off Chalmers Street. The driveway is situated such that large vehicles are able to enter and exit safely in a single turning manoeuvre. As the driveway is already utilised by vehicles up to HRV sizing, there are no anticipated issues with any of the construction traffic reaching the works area within the Sydney Trains Depot. Figure 16 shows the location where access has been proposed to Chalmers Street.
Whilst parking for construction staff may be available within the Sydney Trains Depot, the amount of available parking may not be able to be accurately determined until establishment of the site facilities is resolved. It may be possible to designate additional temporary parking areas within the depot at the expense of reducing the through width of the access road and/or limiting concurrent two-way thoroughfare.

Access to the garden site area adjacent to the Chalmers Street Entrance to Central Station will be via a temporary access point off either Chalmers Street or Eddy Avenue and crossing both the current light rail construction area and existing pedestrian/cyclist shared path. The exact positioning of this access point will need to be such that construction vehicles are able to enter and exit to the external road network in a single manoeuvre and in a forward direction. Depending on the size and scale of construction activities and equipment being used within the work zone, there may be available space for staff parking, however the amount may not be able to be accurately determined until construction activities commence. Therefore, it is recommended that suitable parking capacity be maintained within the Sydney Trains Depot and that reliance on parking within this area is minimised and used for convenience only. Figure 17 shows the location of the proposed access relative to Chalmers Street and Eddy Avenue.
Access to the Elizabeth Street work area will be provided via temporary access on the corner of Eddy Avenue and Elizabeth Street. As with the garden site area, vehicles must be able to both enter and exit in a forward direction, and so in consideration of the narrowness of the site, a separate entry and exit may need to be provided. Entering vehicles must be given clear thoroughfare into the site without queuing back on the public road with exiting vehicles required to give way to existing traffic when leaving the site. **Figure 18** shows the location of the proposed access relative to Eddy Avenue and Elizabeth Street.
Figure 18  Access – Eddy Avenue & Elizabeth Street

Mortuary Station, which has also been proposed for the establishment of a site compound, is able to be accessed via Lee Street through the adjacent bus depot and would be unlikely to impact upon bus services. This site has a relatively large amount of available space and sits within the western side of the rail corridor, potentially catering for staff parking alongside the proposed site offices.

4.3.4  Cumulative Impacts

Whilst the Feeder 7U5 upgrade project is considered to be a relatively small project with only localised and brief interruptions to surrounding services, the location of the project is in areas already the subject of much more significant upgrades. In the immediate vicinity and currently underway is the Sydney Light Rail project. The light rail infrastructure runs directly adjacent to the Chalmers Street garden site area, separated by the existing pedestrian/cyclist shared path. This effectively confines the pedestrian/cyclist shared path to between two individually operating work sites. Access to the project work area will also need to be facilitated through the light rail construction area. For this reason, it will be necessary for there to be coordination between the two sites when assessing the impacts of certain activities on pedestrians and the road network to ensure that the effects of both sites are considered in conjunction. Therefore, the site managers should seek to share their respective schedules of activities to ensure that no major conflicts arise that could potentially have severe cumulative impacts.
The site is also in the location of upgrades as a part of the Sydney Metro project, which is currently underway and includes planned works within Central Station as well as underground tunnelling. Whilst these projects at present are not necessarily interacting with each other, communication and coordination should nevertheless be established with project managers of the Sydney Metro project to ensure they are informed of the scheduling and activities involved in the feeder upgrade.

4.4 Safety Issues

In consideration of the constrained worked areas and attempts to limit the impacts to pedestrian and vehicle amenities throughout construction, it is unavoidable that construction activities will be operating in close proximity to pedestrians, cyclists and road users. Regardless, safety must be considered as a priority.

4.4.1 Pedestrians and Cyclists

Where works are undertaken within areas heavily trafficked by pedestrians and cyclists, appropriate segregations should be used relative to the risks and dangers involved with the activity. The extent of barrier systems used and separation distances between the public should be of a higher scale where heavy machinery or deep trenching occurs. Likewise, more resilient systems should also be put in place where pedestrian and cycle traffic are expected to be congested and the public's awareness of their surroundings may be impacted.

Sight distances, particularly at unsignalized pedestrian crossings should be maintained and if not possible, traffic control used to ensure safe road crossings are available within the construction zones. Where reductions in pathway widths become constrained, unnecessary interactions between pedestrian and cyclists should also be minimised.

4.4.2 Road Users

Whilst construction activities in the vicinity of the public roads may increase the risks of injury to both workers and road users, appropriately management and mitigations can avoid these risks. With context to this project, areas of increased risk may be anywhere where construction activities (geotechnical investigations, trenching etc.) are being undertaken directly adjacent to or within the road, as well as in the vicinity of the site access points.

As a general precaution, it is typical to reduce the speed limit to 40km/h both prior to and within work areas. Further reductions may be necessary where altered lane arrangements are put in place or contra flow traffic management is necessary.

Additional consideration should be given to locations where construction vehicles enter and exit work site areas as it may not always be possible to position access points in locations which are considered optimally safe (safe sight distance, ability to safely merge into moving traffic etc.). Therefore, it may be necessary use traffic control where a particular entry or exit movement may impact on the normal flow of traffic or could present a safety risk.

Alerting the public road users to the presence of construction activities will also assist in reducing conflicts by making drivers aware that they are passing through a construction zone. This can be in the form of static and/or digital signage as well as warning lights.
4.5 Mitigation Strategies

To effectively manage and mitigate the impacts of project construction activities on the public, a Construction Traffic Management Plan (CTMP) inclusive of detailed Traffic Control Plans (TCP) would need to be prepared and submitted to Roads and Maritime Services and City of Sydney. This would occur following the resolution of the construction methodology and once the final locations of the CSR and pits have been determined.

The Contractor should prepare a CTMP relative to each phase of work and specify the following:

- The construction approach and staging.
- All construction traffic demands.
- The construction parking strategy.
- Construction traffic travel routes.
- Road closures and proposed detours (if required).
- Footpath closures and proposed detours (if required).
- Construction compound access and egress locations.

The TCP’s would incorporate standard signage to inform the public of any temporary changes implemented to accommodate the construction activities including works by heavy machinery, road lane and footpath closures including detour routes, changes in speed limits, and warnings when traffic or pedestrians may need to be stopped as directed. This signage would be incorporated in advance of and throughout the works area.

Specific mitigation measures to minimise the impacts of construction activities should also include:

- Active management of pedestrians around and across work sites, particularly on busy pedestrian thoroughfares close to Central Station. The Eddy Avenue underpass requires particular attention as it is a potential bottleneck which experiences high volumes of commuters during peak hours. Any reduction in footpath space at this location during weekday rush hour is likely to result in congestion and risk taking behaviour by pedestrians.

- Traffic management devices including static signage, manual traffic control and the provision of temporary barriers to define the proposed work areas and segregate construction activities, vehicles and pedestrians. This will be particularly important on Commonwealth Street and An Street as due to being quite narrow, pedestrians, vehicles and workers will be in much closer proximity with more constrained thoroughfares.

- The establishment of a safe access point into the garden site area. As this access will pass across a heavily trafficked pedestrian path and link directly to either Chalmers Street or Eddy Avenue, which are busy public roads, measures should be implemented to alert the public particularly during construction vehicle entry and exit movements. This would include manual traffic control, advance signage and audible alarms in addition to alerting the drivers themselves and ensuring that they are provided with safe sight distances while exiting.

- Ensuring that right of way is always given to the public (road users and pedestrians) at access points into work areas, as per the City of Sydney construction traffic management guidelines. This means that at the site access within the garden site area, construction vehicles should not be permitted to leave the site until a gap in pedestrian and/or vehicle traffic presents itself, and only after the exit manoeuvre has begun can traffic be held. Entry manoeuvres may require that pedestrians be temporarily held to prevent large vehicles from propping back into the roadway.
• Staging of the construction activities to minimise the size and extent of cordon work areas. This is to ensure that where possible, the footprint of construction areas is reduced to only be a large as necessary for the works being undertaken. This ensures that spatial priority is retained for the public thus reducing the overall impacts.

• Any temporary realignments of public vehicle and pedestrian facilities which allow circumvention of work areas should be supported by clear signage and pathfinding to identify the realignments and provide clear direction to the public. This will predominantly need to occur along Albion Street, Commonwealth Street and Ann Street where construction will run parallel to the roads and footpaths. Pathfinding and signage would include barriers or fencing to designate new pedestrian walkways and route information (eg. Detour Through to Commonwealth Street or Access to Rydges Hotel).

• The use of traffic controllers if necessary, where concurrent two-way access may not be possible during certain construction activities or where pedestrians may need to be temporarily stopped as construction vehicles or equipment are moved or relocated. Ann Street in particular is unlikely to be able to support concurrent two-way vehicle access if trenching occurs within the road pavement, and therefore manual traffic control would be necessary to direct any contra flow traffic control. Likewise, operation or movement or large equipment along this street may require that pedestrians be temporarily stopped.

• Minimising the requirement for detours by implementing partial closures where possible with reduced through lanes and maintained traffic flow. This will be particularly important on both Eddy Avenue and Elizabeth Street which have high traffic volumes in both directions and where detours could impact public transport routes. In any instance, it will be preferable to reduce the number of through lanes in both directions (eg. from 4-lane 2-way to 2-lane 2-way) rather than restrict one direction entirely (eg. from 4-lane 2-way to 2-lane 1-way). As an example, whilst trenching occurs across the first half of Elizabeth Street, the northbound lanes could be closed and the southbound lanes be reallocated to support both northbound and southbound traffic, and then vice-versa for trenching across the second half of Elizabeth Street.

• Prescribing detours only where necessary, and during off-peak periods as much as practical. In the instance that a street must be blocked entirely, such as where the trenching on Albion street will cross over Mary Street, it may be necessary to temporarily restrict through traffic entirely (eg. on Mary Street). Where this is the only practical solution, this should not be undertaken during peak periods and instead completed off-peak such as in the middle of the day on a weekday or as night works.

• Ensuring that all construction traffic is contained within the designated works areas or parking and storage areas. Construction vehicles should not utilise public parking spaces unless those spaces have been cordoned within a construction area. Workers who commute to the site in vehicles would preferably park within one of the established site parking areas and confirm available parking prior to attending the site.

• Ensuring that traffic control measures within Albion Street give priority to throughput over parking where feasible to prevent unnecessary congestion which may impact Elizabeth Street. In consideration of the volumes of traffic travelling along Elizabeth Street throughout the day, it is critical that traffic turning into Albion Street is able to flow freely and under no circumstance should it be allowed to queue back into Elizabeth Street.
• Ensuring that traffic control measures within Commonwealth Street and Ann Street give priority to parking over throughput where feasible, to minimise the impacts to residents who park in the local area. The majority of residential properties on these streets have no internal parking facilities and rely entirely on the on-street parking. As these streets have generally low traffic volumes, it is therefore preferable to retain as much on-street parking as possible and instead reduce thoroughfare down to one lane (2-way with traffic control).
5 Summary

The Feeder 7U5 upgrade project will inevitably impact upon the public during construction activities due to the nature of works required for the installation of a new feeder route and the requirements of the route to run within the public domain. TfNSW has identified a potential route between the Chalmers Street Substation and the Surry Hills Substation which attempts to minimise these impacts by being contained within the rail corridor for as far as practical, and then following a direct route within public road reserves through to the Surry Hills Substation. Direct impacts to the public will occur along Elizabeth Street, Eddy Avenue, Albion Street, Commonwealth Street and Ann Street, with indirect impacts (such as detours or parking) occurring in the wider area.

These impacts can be mitigated and/or minimised by considering the recommendations presented within this Traffic, Transport and Access Impact Assessment Report which has investigated the potential impacts to traffic and transport related infrastructure and provided mitigation strategies to manage these impacts. The content within this report has been based upon a set of preliminary construction activities, and ultimately should be used to support the development of a Construction Traffic Management Plan once the construction approach has been fully resolved.
## ASIA PACIFIC OFFICES

**BRISBANE**
Level 2, 15 Astor Terrace
Spring Hill QLD 4000
Australia
T: +61 7 3858 4800
F: +61 7 3858 4801

**CANBERRA**
GPO 410
Canberra ACT 2600
Australia
T: +61 2 6287 0800
F: +61 2 9427 8200

**DARWIN**
5 Foelsche Street
Darwin NT 0800
Australia
T: +61 8 8998 0100
F: +61 2 9427 8200

**GOLD COAST**
Ground Floor, 194 Varsity Parade
Varsity Lakes QLD 4227
Australia
M: +61 438 763 516

**MACKAY**
21 River Street
Mackay QLD 4740
Australia
T: +61 7 3181 3300

**MELBOURNE**
Suite 2, 2 Domville Avenue
Hawthorn VIC 3122
Australia
T: +61 3 9249 9400
F: +61 3 9249 9499

**NEWCASTLE**
10 Kings Road
New Lambton NSW 2305
Australia
T: +61 2 4037 3200
F: +61 2 4037 3201

**PERTH**
Ground Floor, 503 Murray Street
Perth WA 6000
Australia
T: +61 8 9422 5900
F: +61 8 9422 5901

**ROCKHAMPTON**
rockhampton@slrconsulting.com
M: +61 407 810 417

**SYDNEY**
2 Lincoln Street
Lane Cove NSW 2066
Australia
T: +61 2 9427 8100
F: +61 2 9427 8200

**TAMWORTH**
PO Box 11034
Tamworth NSW 2340
Australia
M: +61 408 474 248
F: +61 2 9427 8200

**TOWNSVILLE**
Level 1, 514 Sturt Street
Townsville QLD 4810
Australia
T: +61 7 4722 8000
F: +61 7 4722 8001

**AUCKLAND**
68 Beach Road
Auckland 1010
New Zealand
T: +64 27 441 7849

**NELSON**
5 Duncan Street
Port Nelson 7010
New Zealand
T: +64 274 898 628

**NEW PLYMOUTH**
Level 2, 10 Devon Street East
New Plymouth 4310
New Zealand
T: +64 0800 757 695

**NEW ZEALAND**

**ROCKHAMPTON**
rockhampton@slrconsulting.com
M: +61 407 810 417

**SYDNEY**
2 Lincoln Street
Lane Cove NSW 2066
Australia
T: +61 2 9427 8100
F: +61 2 9427 8200

**TAMWORTH**
PO Box 11034
Tamworth NSW 2340
Australia
M: +61 408 474 248
F: +61 2 9427 8200

**TOWNSVILLE**
Level 1, 514 Sturt Street
Townsville QLD 4810
Australia
T: +61 7 4722 8000
F: +61 7 4722 8001

---

[www.slrconsulting.com](http://www.slrconsulting.com)